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POPULATION TODAY

Vol. 18, No. 7/8 July/August 1990

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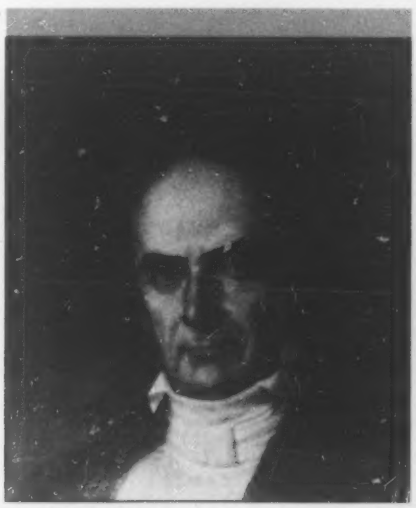

Daniel Webster's plan was one of many. (See page 6.)

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FROM THE EDITOR'S DESK

What do demographers take to the beach for light summertime reading?

Why, population-related fiction, of course. And while real-life population issues have been touched on by such popular writers as Kurt Vonnegut and Evelyn Waugh, most fiction about population is, frankly, gaudy Science Fiction.

Take, for example, *City.* This novel by Clifford Simak tells how a future "rural renaissance" not only makes U.S. cities obsolete but ends the threat of nuclear war—no more urban targets. (More amazing yet, the novel describes a 21st-century census enumerator going door to door—but then, *City* was published in 1952.)

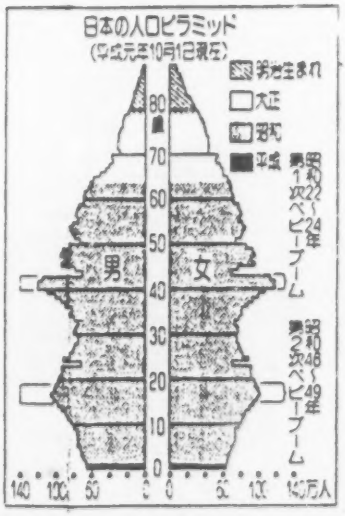
The Wanting Seed (1962) by Anthony Burgess, author of *A Clockwork Orange,* shows coercive family planning in an overcrowded world. *Make Room! Make Room!* (1966) by Harry Harrison (later the Charlton Heston movie, *Soylent Green*) describes how population pressures cause a modification (to put it mildly) in human diet. And in *The Space Merchants* (1953), C.M. Kornbluth and Frederik Pohl satirically depict a densely-populated future where every person and natural resource is commercially exploited to the max.

But the ultimate population parable is surely the futuristic short story "Build-Up" (1960) by J.G. Ballard *(Empire of the Sun).* Ballard's hero has always assumed that the ultra-congested megalopolis where he lives encompasses the entire earth. What he ultimately discovers is that this megalopolis now fills the entire *universe,* and every cubic light-year has gone condo—a grim, dystopian vision that makes even summer at the beach seem positively deserted.

—Art Haupt

SPEAKING GRAPHICALLY

Japan Worries About Fertility



In contrast to the fertility "rebound" experienced by some low-fertility countries (such as Sweden, West Germany, and the U.S.), in recent years Japan has experienced a steady decline in both fertility and annual births since 1973, the peak of its baby boom echo. In 1989, the population growth rate reached a postwar record low of 0.38 percent, while the just-reported 1989 total fertility rate of 1.57 lifetime children per woman is the lowest in history.

The Japanese government recently published a Health and Welfare White Paper entitled "Child, Family, and Community in the Longer Life Society," painting a negative picture of the social consequences of fewer children. Perceived problems include the "weak" social development of only children, work force shortages, and increasing pension and medical care burdens as the population that pays for these services—those in the working ages—begins to lag.

Analyzing the trend, the newspaper *Nikkei* attributed the recent fertility decline to a number of factors: a rise in age at first marriage (24.2 in 1972 to 25.8 in 1985) that has increased the proportion of unmarried women at their peak childbearing ages of 25-29 (from 20 percent in 1970 to 31 percent in 1985), as well as a growing number of two-worker families (one-fifth of couples with children under the age of 6) and generally expensive housing costs and population density. Among the proposed remedies: more support for child-care facilities, parental leave for child-care purposes, and programs to help working mothers re-enter the labor force.

—M.Y.

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Circulation Director: Jacki Majewski

Editorial and Circulation Offices:
Population Reference Bureau, Inc.
777 14th St., N.W., Suite 800
Washington, D.C. 20005
(202) 639-8040

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Shifting from Pro-Growth to No Growth

As world population expansion continues apace, shifts have occurred in the attitudes and policies of many governments toward increase within their national borders.

Decades ago, many less developed countries (LDCs) favored population growth for various reasons, including the belief that such growth could be a stimulus, not an impediment, to economic development.

With time, however, official pro-growth stands in many LDCs have become more equivocal. Countries have acquired experience in the effects of population increase, and official uncertainty has mounted as to the potential ultimate effects if growth continues. (A quarter-century ago, when LDC growth rates were at their peak—about 2½ percent per year—there were less than two-thirds as many people on earth as there are today.)

To what extent have official attitudes changed? The United Nations Population Division tracks national population policies on a continuous basis; the Division's newest report, *Trends in Population Policy,* just published, finds that as of 1989, 40 percent of the 170 governments surveyed feel that their country's growth is too high, 45.3 percent feel that growth is "satisfactory," and the remainder, 14.7, find it too low. In the 15-year period from 1974 to 1989, the number of "too-low" countries has dropped from 39 to 25, while the "too highs" are up to 68, from 43. (The study followed 156 countries for the period 1974-1989, and 14 additional countries whose coverage started after 1976.)

Viewed in terms of population, the policy shift seems less dramatic. In 1974, the "too lows" constituted 11.7 percent of world population. By 1989 this percentage was down to 5.4 percent. These countries with "too-low" attitudes toward their growth tend to be less populous than the "too-high" countries.

The vast majority of the world's countries offer direct support to contraceptive access, and the report finds that 123 countries, containing 91.2 percent of the world's population, offer this support; these figures are up somewhat from 1974's already high proportion. Only seven countries, containing 1.3 percent of population, now limit access to contraception.

As nations' populations have grown, so has their interest in family planning.

During this period, government attitudes toward immigration have changed considerably. Whereas in 1974, only 10 countries had policies to lower the level of immigration, by 1989, this figure had risen to 54 countries, which contain one-fifth of the world's population. Although 61 percent of countries find their levels of immigration not to be significant, that figure marks a decrease from the 76 percent of 15 years earlier and may be a reflection of attitude rather than significant immigration shifts.

Similarly, concern about internal migration has dropped slightly. One hundred and sixteen countries have policies to decelerate or reverse their internal migration; this is down from 117 in 1974, but it's noteworthy that so many governments should be dissatisfied with their countries' internal migration trends.

Trends in Population Policy is available from the UN (Sales No. E.89.XIII.13). Also available are the first two volumes (of three) of *World Population Policies,* an encyclopedic country-by-country reference work that describes national population policies in more detail. (Sales Nos. E.87.XIII.4 and E.89.XIII.3, respectively.)

–A.H.

World Population Day

World Population Day is July 11.

Each year the United Nations Population Fund (UNFPA) commemorates this day to "heighten public awareness of population issues."

Population Day events this year are taking place in some 100 countries, and include radio and television coverage, seminars and workshops, school competitions, newspaper supplements, and exhibits. The UNFPA has also produced an educational videotape, *The Challenge Ahead,* which describes the social, economic, and environmental impact of an additional billion people every 12 years. The videotape is being distributed worldwide.

Why July 11? That date in 1987 was the putative day that the Earth reached 5 billion, by the UNFPA's calculations.

Boom and Bust Prompt U.S. Cities to Change

The city names may be the same, but much else has changed in the population dynamics of U.S. metro areas. In recent years, internal migration, shifting economic conditions, and new living patterns have caused urban boom and bust, as well as forced cities into new, unexpected economic and social roles.

What processes have been at work? And—looking ahead—what's in store for America's cities in the 1990s and beyond? In PRB's latest *Bulletin,* "Metropolitan America: Beyond the Transition," author William H. Frey examines the increasingly volatile dynamics of urban population change in the past two decades.

Through most of the 20th century, the national trend was toward population concentration in large cities, as rural Americans gravitated toward urban settings, drawn by nonagricultural jobs and expanding economies. Some 39.6 percent of the national population lived in urban areas in 1900; by 1980 the figure was 73.7 percent.

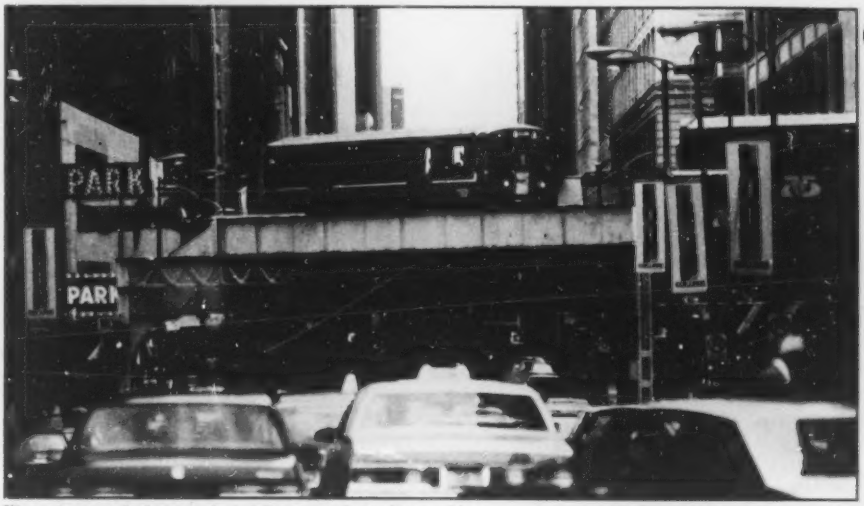
In the 1970s, that movement slowed, or even reversed, during a brief "rural renaissance," when a change in settlement patterns resulted in nonmetropolitan areas (then containing about 31 percent of the population) growing faster than metro areas.

Since the 1970s, population growth in the larger urban areas has revived somewhat, while the populations of smaller metro areas, some of which had been hard hit by economic decline, have stagnated. Some urban areas—particularly those in the South, the West, and along the Atlantic and Pacific coasts—have experienced new population booms, and a number of cities have adapted to new times by taking on new roles.

Among the new U.S. urban roles that Frey describes are:

- **World cities,** cities that are strong financial and trade players in the international economy (e.g., New York, Los Angeles).
- **National command and control centers,** new urban keystones of the domestic economy (e.g., Boston, Atlanta, and Minneapolis-St. Paul).

Chicago Convention & Visitors Bureau



The stress of change has hit many American cities.

- **Specialized areas** that rely heavily on one or two economic sectors (e.g., Houston, San Diego).
- **Smokestack areas,** cities previously dominated by heavy industry, the economic decline of which has forced them to attempt diversification into service or high-tech fields.

Frey, who is Research Scientist and Associate Director for Training at the Population Studies Center at the University of Michigan, also appraises the increased attraction of "magnet" cities to either baby-boom or elderly populations. He analyzes the rapid growth of minority populations in some metropolitan areas—in Los Angeles and San Antonio, minorities as a whole have actually become the majority. And, looking into the future of U.S. cities, he foresees prosperity for the major "world cities" and "command and control centers," spreading population inland from densely settled coastal areas. The ability of "smokestack areas" to rebound from economic setbacks and diversify remains a question mark.

—A.H.

Copies of the 56-page *Population Bulletin,* "Metropolitan America: Beyond the Transition," by William H. Frey, (Vol. 45, No. 2, July 1990), can be ordered from PRB, Circulation Dept., P.O. Box 96152, Washington, D.C. 20090-6152, with checks payable to PRB; or by calling 1-800-877-9881. Visa and MasterCard accepted. Prices for the *Bulletin* are: $7.00 a single copy; 2-10 copies, $6.50 ea.; 11-50 copies, $5.50 ea.; 51 or more, $4.00 ea.

Orders of $50.00 or less must be prepaid and include $1.00 or 3 percent of total order (whichever is greater) for postage and handling.

1990 Census Forges On

Despite widely reported problems with mail return of census forms (see *PT,* June 1990), the Census Bureau's door-to-door follow-up has yielded results. The mail return of forms in April 1990 was 63 percent. This was significantly lower than expected. Nonetheless, phone calls and visits by enumerators in the three months following Census Day have succeeded in netting the vast majority of outstanding forms. By July 1990 the Census Bureau had in hand 99 percent of forms, and 80 million had been processed. Processing is being done at the Bureau's seven giant regional centers around the country, where forms are microfilmed and the statistical data transferred to computer tapes. The font of decennial census data will begin to flow in January 1991.

—A.H.

SURVEY REPORT

Nigeria (Ondo State)

Although certainly not the largest in terms of area, Nigeria is by far the most populous of any African country—containing by current estimates more than 118 million people. The exact population of Nigeria nonetheless remains uncertain. The country has not held a population census since independence in 1963. A 1973 census was abandoned because of data irregularities.

The country's National Population Bureau began an Enumeration Area Demarcation Exercise in 1983 to attempt to develop a population-based sampling frame for use in various surveys. By 1985, this exercise had proceeded slowly, but had made the most progress in Ondo State, located in the southwest part of Nigeria and containing a population 2.7 million, according to the 1963 Census (the most recent census). For this reason, and because the state's Ministry of Health expressed a desire for data on health and fertility, a Demographic and Health Survey of Ondo was conducted during 1986-1987.

The majority of the 4,213 women interviewed in the Ondo State DHS are members of the Yoruba ethnic group (Ondo is 85 to 90 percent Yoruba); 84 percent are Christians; 40 percent live in urban areas, 52 percent in rural areas and 8 percent in riverine areas.

Fertility is high in Ondo: At fertility rates prevailing in 1986-1987, women were having 6 children each. This is also the ideal family size stated by married women.

Fertility was virtually the same in both urban and rural areas, but women with no education were having 6.7 children each, compared with 5.4 children for women with a secondary or higher education. There is some evidence, however, that younger women's fertility is lower than that for older women (those 40-49), who have mostly completed childbearing and had an average of 6.9 children each.

World Bank

Contraceptive use is low among married Ondo women.

The state's use and knowledge of family planning is low. Fifty-one percent of married women could recognize at least one contraceptive method, and most of these women also could name a source where they could obtain the method. However, only 13 percent of married women have ever used a contraceptive method, and only 6 percent are currently using a method.

The most widely used modern method is the pill (1.4 percent), followed by injection (1.2 percent) and IUD (0.7 percent). About 2 percent of married women use traditional methods, primarily periodic abstinence (1.9 percent). Use is much higher in the urban areas (8.9 percent) and among the more educated women (15 percent) than in the rural areas (4.5 percent) and among those with no education (2.9 percent). Thirty-seven percent of women using family planning obtain their methods from government hospitals or health centers. One-third of pill users receive supplies from pharmacies or shops.

Concerns over health appear to be a barrier to use of family planning. Of women who were not using family planning and did not want to become pregnant, 27 percent gave health concerns as the main reason for nonuse. Other reasons included lack of knowledge (18 percent) and opposition to family planning (8 percent). About three in four Ondo women say they approve of family planning, but only two in five think their husbands approve and an equal number do not know their husband's opinion.

Seventy-five percent of married women not using family planning are considered to be in need of it because they either want no more children (21 percent), or want to wait at least two years before having a child (54 percent). Of these women, only one in three intends to use family planning in the future.

Infant mortality in Ondo State was 56 deaths per 1,000 live births for the period 1981-86. Mortality did not differ greatly between rural and urban areas, but was markedly higher for infants born less than two years after a sibling (80 deaths per 1,000 live births) and for children born to mothers age 19 or less (93 deaths per 1,000 live births).

Prenatal care is widespread. For 80 percent of the births in the five years before the survey, mothers received prenatal care from trained medical personnel. For 71 percent of recent births, mothers received an anti-tetanus injection and 59 percent of the deliveries were attended by a doctor, nurse, or midwife at delivery. Still, women in the riverine areas appear to be at a disadvantage. Among children ages 12-23 months, 37 percent had health cards verifying their immunization status. Seventy percent of these children had received all of the recommended vaccinations. The Ondo State DHS found that 32 percent of children ages 6-36 months show signs of chronic malnutrition.

—B.S.

DEMOGRAPHER'S PAGE

Apportioning U.S. Congress: A Primer

by Dudley L. Poston, Jr.

As required by law, on or before December 31 of this year, the Secretary of Commerce will deliver to the President the April 1, 1990 total population counts for each of the 50 states.

These data from the 1990 Census will be used to decide how many U.S. congressional representatives are allocated to each state. The allocation procedure employed is known as the Method of Equal Proportions, implemented in 1940, which has now been used to apportion Congress in the five most recent apportionments. (From 1790 through 1980 there were 20 enumerations and 19 apportionments; see page 8.)

The first U.S. census was conducted a mere three years after the framing of the Constitution to provide an empirical basis for apportioning the U.S. House of Representatives and to determine the levels of taxation among the 13 states. This latter function was subsequently taken on by the Internal Revenue Service, but the former remains today as the principal reason and justification for conducting a decennial census. Indeed the requirement for a decennial census was written into the Constitution in 1787:

> Representatives and direct taxes shall be apportioned among the several states which may be included within this Union according to their respective numbers. . . . The actual enumeration shall be made within three years after the first meeting of the Congress of the United States, and within every subsequent term of ten years in such manner as they shall by law direct.
>
> –The U.S. Constitution, Article 1, Section 2

However explicitly it may prescribe the distribution of members in the House of Representatives to the various states according to their respective populations, the Constitution is silent about how apportionment should be carried out. If James Madison had had his way, specific apportionment language would have been included in the Bill Of Rights. Indeed, the body of constitutional amendments passed by the Congress in September 1789 contained 12 amendments, not just the 10 known today as the Bill of Rights.

The first two of the 12 were proposals dealing with explicit procedures for apportioning the Congress and for compensating the members of Congress. But they met with such widespread dissatisfaction in the various states of the Union that most state legislatures defeated them during the ratification process. Our Bill of Rights is thus the third through the 12th amendments originally set out by Madison.

Dividing Up the Seats

Equity is the major issue in determining distribution of the U.S. House of Representatives. Since 1913, the number of House seats has been fixed at 435 (except for a brief period after the admission of Alaska and Hawaii). Further, partial representatives cannot be assigned to states, nor can representatives be given fractional votes or be shared by two or more states.

Given these parameters, how can the 435 seats be assigned so that the populations represented by each seat are as equal as possible?

The Constitution requires that every state be assigned at least one seat in the House. The first 50 seats are thus taken. What the Method of Equal Proportions does is specify how to divide up the remaining 385 seats. It tells us which states should receive second seats, which states should receive third seats, and so forth.

Considerations of equity dictate that the population requirements used to distribute seats beyond the initial seat increase proportionally. (The population should be higher to qualify for three seats than two, four seats than three, etc.) The Method of Equal Proportions, it is argued, increases the requirements as fairly as possible.

To use this method, the first step is to multiply the apportionment[1] population of each state by the following Equation 1:

$$\frac{1}{\sqrt{N\,(N-1)}}$$

where N equals the particular seat being claimed, i.e., the second seat or the third seat or the fourth seat, and so on. Multiplying this proportion by the states' populations provides numbers known as priority values.

I now examine the priority values for a few of the various numbered seats. Equation 2 (below) shows the calculation for a state's claim to a second seat:

$$\frac{1}{\sqrt{2\,(2-1)}} = \frac{1}{\sqrt{2}} = \frac{1}{1.41421356} = 0.70710678$$

Equation 3 shows the calculation for a state's claim to a third seat:

$$\frac{1}{\sqrt{3\,(3-1)}} = \frac{1}{\sqrt{6}} = \frac{1}{2.44948974} = 0.40824829$$

Equation 4 shows the calculation for a state's claim to a 40th seat:

$$\frac{1}{\sqrt{40\,(40-1)}} = \frac{1}{\sqrt{1560}} = \frac{1}{39.49683532} = 0.02531848$$

Since the various proportions are roughly equal to 1/N, the proportion a state would use to claim a second seat is obviously larger than that used to claim a third seat or a 40th seat.

Once the proportions for determining the priorities for the various seats have been computed, these proportions are multiplied by the apportionment populations of each of the 50 states. That is, the proportion used for determining the states' priorities for a second seat (0.70710678) is successively multiplied by the apportionment population of each state; and then this procedure is repeated using the proportion to determine the states' priorities for a third seat (0.40824829), a fourth, fifth, etc., up to 385.

After all of these multiplications have been done, the resulting priority values are then ranked in descending order. The 385 House seats are assigned to the states with the 385 high-

Dudley L. Poston, Jr. is Professor and Chair, Department of Rural Sociology and Graduate Field of Development Sociology, Cornell University

est priority values.

Table 1 reports the application of the Method of Equal Proportions using 1980 Census counts and shows the states receiving the first six seats and those receiving the last six seats. California received the 51st seat. Its priority value for a second seat, 16,736,201, was obtained by multiplying its 1980 resident population of 22,668,562 by the "second seat" proportion shown in Formula 2 above of 0.70710678.

New York received the 52nd seat with its priority value for a second seat of 12,414,877, determined by multiplying its 1980 resident population of 17,557,288 by 0.70710678. Texas was next in line with its priority value for a second seat of 10,060,986; its second seat was the 53rd seat allocated.

As shown in the table, the Method of Equal Proportions allocated the 51st through 53rd seats to the three most populous states, California, New York, and Texas. But the fourth largest state, Pennsylvania, did not receive the 54th seat because its priority value for a second seat, 8,391,044 (its population multiplied by the "second seat" proportion shown in Formula 2), was smaller than California's priority value for a third seat, 9,662,650 (California's population multiplied by the "third seat" proportion shown in Formula 3.)

Pennsylvania and Illinois received their second seats as the 55th and 56th seats allocated. Ohio received its second seat as the 57th seat; New York's third seat was the 58th allocated; Florida's second seat was the 59th; and California's fourth seat was the 60th.

Table 1 also shows the states receiving the last six seats in the House, the 430th through the 435th seats. Observe for instance that Pennsylvania's priority value for a 23rd seat was larger than Colorado's claim for a sixth seat, so that the 431st seat was assigned to Pennsylvania and the 432nd to Colorado. New York received the 435th and last House seat allocated as its 34th seat.

Table 1. Application in 1980 of the Method of Equal Proportions: Allocating the First and Last Six Seats in the House of Representatives

Numbered seat in the House	State	Numbered seat in the state	Priority value
First six seats			
51	California	2	16,736,201
52	New York	2	12,414,877
53	Texas	2	10,060,986
54	California	3	9,662,650
55	Pennsylvania	2	8,391,044
56	Illinois	2	8,074,071
Last six seats			
430	Kansas	5	528,429
431	Pennsylvania	23	527,540
432	Colorado	6	527,427
433	Ohio	21	526,860
434	Florida	19	526,678
435	New York	34	524,157

The states of Indiana, Georgia, and California were next in line to receive the 436th, 437th, and 438th seats, were the House to have allocated three more seats. These would have been the 11th seats for Indiana and for Georgia and the 46th for California. I have estimated the populations that would have been needed for either Indiana or Georgia to have been allocated New York's 435th seat. If no other state's population changed, Indiana would have needed about 7,200 extra people in its 1980 count, or Georgia would have needed another 33,000, for either of the states to have been allocated the 435th seat that was assigned to New York.

Some states received only one seat: Alaska, Delaware, North Dakota, South Dakota, Vermont, and Wyoming. And a few other states received only two seats: Hawaii, Idaho, Maine, Montana, Nevada, New Hampshire, and Rhode Island. The second-seat priorities for the former group of states, and the third-seat priorities for the latter group of states, were all less than the 34th-seat priority of New York, which received the 435th and last seat.

Although the Method of Equal Proportions has been in use since 1940, during the 150 years prior to its adoption, apportionment procedures engendered a good deal of controversy, involving some of the better known figures in our country's heritage.

Apportionment's History

The Jefferson plan. The first apportionment procedure was established after considerable debate. In 1791 the House drafted their first apportionment bill, allowing one representative for every 30,000 in any state, 112 representatives in total. The Senate objected and drafted an alternative bill assigning one representative for every 33,000 in the country as a whole, or 105 representatives.

Congress then deadlocked on the apportionment question as the members from the various states realized that variations in the divisors influenced differently the numbers of representatives for the states. Moreover, the apportionment results were also affected by whether the fraction remaining from the quotient was dropped (Jefferson's plan) or rounded (Alexander Hamilton's plan). After extensive debate, the Congress finally wrote and passed a bill in March 1792 setting the House size at 120 using Hamilton's method of apportionment. Southerners saw this bill as discriminating against

Continued on next page

Demographer's Page
Continued from preceding page

the South, so President Washington exercised the first veto against it.

When Congress failed to override the veto, a bill following Jefferson's plan was passed setting the size of the House at 105, with a divisor of 33,000. Jefferson's plan is known as the Method of Rejected Fractions because after dividing the population of each state by 33,000 and apportioning to the state as many representatives as there were units in its quotients, the remainders were discarded or rejected.[2]

The Webster plan. The apportionment issue surfaced again in 1832 when Daniel Webster and others argued that the Jefferson plan "discriminated against small states by disregarding the fractions of a quota."[3] The heart of Webster's argument was that the Constitution stated that seats be assigned "as near as may be" to the population of each state. A modified form of his plan, awarding an additional seat to every state having one-half or more of the appropriate divisor, was used in 1840. The plan reduced the size of the House by 17 members (excluding the new representatives from California, Florida, Iowa, Texas, and Wisconsin). Although used only once, the Webster plan, because of its constitutional interpretation, continues to have a major influence on discussion about alternate apportionment methods.

The Vinton plan. With both the Jefferson and Webster plans, the House of Representatives could have a different number of seats each time it was apportioned. In our country's early years, this kind of variation was not seen as a major problem. But it soon became apparent that continued growth in the number of House seats could have deleterious effects on its daily operation.

Accordingly, Samuel F. Vinton, a Representative from Ohio, introduced his bill, which was adopted and employed in 1850 and used through 1900. It endeavored to combat the major problem of the earlier approaches, namely, their inability to predetermine the size of the House. The Vinton plan set a fixed number of members, derived a quota, and divided the population of each state by this quota. It then assigned one member to each state with less than one quota and assigned a number equal to the integer of the exact quota to all the other states. The remaining seats were assigned to those states with the largest fractions of a quota.

The use of this approach, however, resulted in what has become known as the "Alabama paradox," a situation whereby one state would lose a seat if the size of the House were increased. It was shown that if the House were expanded from 299 to 300 following the 1880 Census, the "remainders for Illinois and Texas would have passed that for Alabama, and Alabama would have lost a seat."[4]

The Major Fractions Method. In 1910, Congress adopted a more refined and complex version of the Vinton plan. Under this method, developed by Walter F. Willcox, a prominent statistician and demographer at Cornell University, each state was assigned one House seat and a priority list was then developed for assigning the remaining seats.

This method was called the Major Fractions Method because by "using an arbitrary divisor. . .every state with two or more seats received a member for each integer and each major fraction of the selected divisor."[5]

The method overcame the "Alabama paradox" problem of the Vinton plan. However, its interpretation of the Constitution's "as near as may be" phrase was the ratio of members divided by the population. An equally fair case could be made for the interpretation to be based instead on the equal distribution of Congressional districts, that is, population divided by members.

The Method of Equal Proportions. After the 1920 Census, there was no reapportionment of the House. Many members of the House believed the "1920 Census figures were inaccurate and. . .that temporary migrations caused distortions in the total reported."[6] Congress was also deadlocked in debate regarding the question of how to apportion. "Forty-two reapportionment bills were offered, but none passed."[7]

Finally in 1929 a committee from the National Academy of Sciences was convened to consider all the mathematically and theoretically correct apportionment methods.[8] The committee reasoned that since fractional voting was not allowed, apportionment based on proportions was not possible. The problem was really one of applied mathematics, or developing a solution based on a rationale outside mathematics.

The committee decided that the Method of Equal Proportions satisfied both sides of the apportionment problem: equitable population size of districts and number of seats. And the method did not discriminate by size of state. Congress then decided that automatic reapportionment would follow each census, and that results using both the Major Fractions and the Equal Proportions Methods would be

POSITIONS/PROFESSIONALS

African Dissertation Internship Awards are offered to doctoral students from sub-Saharan Africa by the Rockefeller Foundation, enabling Ph.D. students enrolled in U.S. and Canadian universities to return to Africa for extensive field research in areas relevant to economic development or poverty alleviation. Priority is given to research topics in agriculture, health, and life sciences, but other proposals are welcome. **Requirements:** Applicants are responsible for arranging affiliation with an African institution. The candidate's faculty adviser, the host institution in Africa, and the agency responsible for financing the student's graduate work, all must send letters of endorsement. **Deadlines for Applications:** October 1, 1990 and March 1, 1991.

For further information, contact: African Dissertation Internship Awards, Rockefeller Foundation, 1133 Avenue of the Americas, New York, N.Y. 10036.

reported to the President, but that the Major Fractions Method would be the one used.

The 1930 Census was the first census to follow these decisions, and both methods produced identical distributions. In 1940, though, the two methods gave different results. Under the Major Fractions Method, Michigan gained a seat lost by Oklahoma. Automatic reapportionment measures were then invoked, but the Congress immediately began to reconsider the two methods. They decided that only the Method of Equal Proportions be reported in 1950, and the decision was made retroactive so that Oklahoma could regain its seat. The Method of Equal Proportions has been used ever since.

The Future

In the early 1980s, questions were raised about the degree to which the Method of Equal Proportions was equitable. Some suggested that we should return to the approach originally proposed by Daniel Webster. It has been argued that the "time has come to restore Webster's formula as the only acceptable method of apportionment that meets the constitutional standard of one man, one vote."[9]

While the apportionment of the House after the 1990 Census will be based on the Method of Equal Proportions, it will be interesting to see whether discussions are introduced in Congress and elsewhere, about revising or changing the apportionment procedures. Many large Northeastern and Midwestern states lost representatives in 1980 because of population shifts; and many of these same states stand to lose even more representatives in 1990. For one reason, around 90 percent of our country's population gains in the 1980-1990 decade probably has occurred in the South and the West.[10]

If the proponents for a change in the apportionment procedure can successfully demonstrate that the Method of Equal Proportions indeed discriminates against the larger states, then we could well see renewed discussion about, and even changes in, the apportionment methodology by the turn of the century.

Continued on next page

SOFTWARE

UVPopSim is a demographic program that enables the user to project a population from one to 1,000 years in the future. Once data have been typed in (or imported from standard text files) in single-year or five-year, sex-specific age groups, immigration, emigration, and vital rates are all easily modeled and may be varied over time. Projections can be performed for numerous demographic measures, with results generated in tabular form or as population pyramids, and either viewed on-screen or sent to a printer.

UVPopSim stands for University of Victoria Population Simulation Program. The program runs on IBM PCs and compatibles (either from a floppy drive or a hard drive) and includes a context-sensitive help function. It requires 400K of free memory.

UVPopSim is available from Interactive Solutions, 3869 Persimmon Dr., Victoria, B.C. V8P 3R8, Canada. The price is $34.00; student and quantity prices on request. (For orders from within Canada, the prices are in Canadian dollars; for orders from outside Canada, these prices are in U.S. dollars.)

–A.H.

POPULATION UPDATE

Estimated United States Population:

As of April 1, 1990	250,688,000
As of April 1, 1989	248,127,000

The above estimates, the latest available, include armed forces overseas and are from U.S. Bureau of the Census, *Current Population Reports,* Series P-25, No. 1060.

Estimated World Population:

As of July 1990	5,321,000,000
Annual growth	93,000,000

Extrapolation from the mid-1990 population on PRB's *1990 World Population Data Sheet.*

Latest Provisional Statistics for the U.S.: February 1990

	12 months ending with February					
	Number		Rate			
Item	1990	1989	1990	1989	1988	1987
Live births	4,054,000	3,913,000	16.3	15.9	15.8	15.5
Deaths	2,167,000	2,160,000	8.7	8.8	8.8	8.7
Natural increase	1,887,000	1,753,000	7.6	7.1	7.0	6.8
Marriages	2,427,000	2,391,000	9.8	9.7	9.8	9.9
Divorces	1,172,000	1,193,000	4.7	4.8	4.7	4.8
Infant deaths	38,900	38,400	9.6	9.9	10.0	10.4
Population base (in millions)	. . .	. . .	248.8	246.1	243.7	241.4

Note. Rates are given per 1,000 population, except for infant deaths, which are given per 1,000 live births.
Source. Monthly Vital Statistics Report (Vol. 39, No. 2) from the National Center for Health Statistics.

Demographer's Page

Continued from previous page

Acknowledgment

Parts of this paper are adapted from D.L. Poston, Jr. and M.T. Coleman, "The Mechanics of Congressional Apportionment," *Intercom,* January 1981, pp. 8-10; and from pp. 115-119 (written by D.L. Poston, Jr.) in C.P. Kaplan, T.L. Van Valey and Associates, *Census '80: Continuing the Factfinder Tradition,* Washington, D.C.: U.S. GPO, 1980. I thank Robert Speaker and Sam T. Davis, both of the Census Bureau, for addressing some of my questions about apportionment and its applications in 1980 and 1990.

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   This matter was reviewed and considered in 1950, 1960, and 1980, but the overseas populations were not incorporated into the apportionment populations for those years because their numbers were then deemed to be too few for inclusion. However, when the Method of Equal Proportions is applied using the 1990 Census data, the apportionment population will be defined in the same way as it was in 1970 so as to include the state's resident population, as well as the military and civilian personnel of the federal government and their dependents claiming the state as their state of record.
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5. *The Decennial Population Census and Congressional Apportionment,* op. cit., p. 16.
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8. For more discussion, see Laurence Frederick Schmeckebier, *Congressional Apportionment,* Washington, D.C.: Brookings Institution, 1941; also, see Davis, op cit., p. 27.
9. M.L. Balinski and H.P. Young, "When House Seats Shift, Fractions Count," *Washington Post,* November 30, 1980, p. D5.
10. Judith Waldrop and Thomas Exter, "What the 1990 Census Will Show." *American Demographics,* January 1990, p. 24.

TAKE A NUMBER

A Million New Americans: Over 1 million aliens became permanent U.S. residents in 1989, a number comparable to the peak years of immigration in the early 20th century. But it may be a bit misleading to think of all these 1,090,924 persons in terms of "immigration" since almost half, 492,200 to be exact, received permanent resident status under the provision of the 1986 Immigration Reform and Control Act (IRCA). The balance of the 1-million-plus was the usual annual flow of immigrants and refugees.

Should the entire group be counted as "immigration" and placed in the table showing the U.S. time series on historical immigration trends? Technically yes, since the IRCA "entrants" are true legal immigrants. However, they haven't suddenly arrived all at once, because they were already here—having entered the U.S. over a considerable period of past years. This was a ticklish problem for statisticians at the Immigration and Naturalization Service (INS), who ultimately decided to include the IRCA entrants in the 1989 immigration total.

A graph of U.S. historical population trends now gives the impression that immigration took a sudden jump in 1989. But the spike in that year essentially represents a one-time influx resulting from specific legislation, and alone does not signify a sharp upswing in the long-term immigration trend.

Veteran Population: As U.S. involvement in major wars slips further into history, the overall size of the veteran population is expected to decline. The Department of Veteran Affairs projects that the 27.2 million veterans estimated in 1989 will decline to 24.1 million in 2000 and then to 13.0 million in 2040. Despite the decrease in total size, the number of veterans over age 65 will continue to rise and, in fact, "peaks" twice. World War II and Korean War veterans will cause a bulge to 9 million about 1999 when they hit 65 years, and Vietnam Era veterans will cause a second peak at 8.6 million in 2015. The DVA expects significant growth in the veteran population throughout the Sunbelt as older veterans follow the national trend towards a warmer clime at retirement. Increases in the number of veterans are expected in such warm-weather states as Florida, Arizona, Texas, and the Carolinas, even as declines will become apparent in the Northern states.

—C.H.

ADDENDA

"Miss Featherbee," by Leila Cabib

ZAK! YOUR BABY SIS GOT HERSELF A JOB!
HA! JOINING THE RANKS OF THE GREAT UNNUMBERED, HUH?
I DON'T BUY THAT, ZAK. I THINK EACH OF US MAKES A DIFFERENCE.
AND I SAY IT'S TIME TO STAND UP AND BE COUNTED! MY CARD.
FIGURES...
U.S. CENSUS ENUMERATOR.

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CURRENT READINGS

PRB welcomes materials on population topics for possible inclusion in Current Readings. Publishers may address review copies to Book Review Editor, POPULATION TODAY, Population Reference Bureau, 777 14th St., N.W., Washington, D.C. 20005

POPULATION GEOGRAPHY, by Gary L. Peters and Robert P. Larkin. (3rd ed.) Dubuque, Iowa: Kendall/Hunt, 1989. 295 pages. $27.95 paperback. ISBN 0-8403-4722-7.

"It is hard to admit," writes Mario Ortolani, in the special 20th issue of *Espace Population Sociétés,* "that one can advance and dynamize the discipline of geography by. . .appropriating the concepts, methods and research topics belonging to a distinctly qualified discipline: demography."

Geographer Ortolani's reluctance to acknowledge the demographic science stems from his belief that geography should do more than address population data as collections of statistical artifacts. Population geography analyzes patterns in the spatial distribution of people. What was the confluence of factors which led to settlement here, rather than there? What was the historical and geographical context in which these patterns unfolded?

The authors of *Population Geography* largely succeed in highlighting the subdiscipline's special qualities. Although several parts could just as easily have been written by demographers, the book devotes entire chapters to more distinctly geographical concerns such as the environment, food supplies, and mobility and migration.

As an introductory geography text, the authors rightly place great emphasis on high rates of population growth and their repercussions. The first chapter deals with recent trends in population growth and projections, and other chapters remind us of the relevance of current rates of growth for population distribution, environmental degradation, and food security. Chapters on mortality and fertility address the influence of these factors on current trends, and another chapter discusses the effects of organized family planning and "population control" policies on growth.

The text is amply peppered with tables, charts, and choropleth maps illustrating U.S. and world vital statistics differentials, densities, age distributions, etc. Although it would have been nice to see more on the distinct features of particular peoples, one text can only be expected to cover so much ground.

—Alex de Sherbinin

POPULATION GROWTH AND POVERTY IN RURAL SOUTH ASIA, edited by Gerry Rodgers. New Delhi: Sage Publications, 1989. 249 pages. ISBN 0-8039-9600-4.

This volume looks at important linkages between poverty and population in rural South Asia. Its empirical studies of India, Pakistan, Bangladesh, and Nepal, use a variety of analytical techniques and multiple focuses (household, village, and national levels) and analyze the major demographic variables (fertility, mortality, and migration).

All the studies start with two major premises. First, that the indirect effects of population growth on poverty are at least as important as the direct effects. And second, the authors use a broad definition of poverty, including relative deprivation and insecurity, and they examine the tradeoffs that families may make under various conditions.

This is a very interesting collection; all the papers highlight the far-reaching nature of poverty in rural South Asia and the gap between individual households' needs and those of aggregate social policy, particularly regarding fertility. The papers on Bangladesh and Nepal are particularly useful in outlining the general poverty context.

There was nevertheless one disturbing "straw dog" argument that ran throughout the book: that population specialists contend that population policies alone will solve the poverty problem. This perspective was most noticeable in Gerry Rodgers' introduction and his chapter on rural Bihar, and to some extent in the papers on Pakistan and Nepal. There may have been a time when population specialists over-argued the case for reducing population growth as a "cure-all" for poverty, but this reviewer doubts anyone argues it now.

This said, if readers can avoid getting irritated by the tone of the book, much valuable information is contained within.

—Nancy Yinger

RURAL AND SMALL TOWN AMERICA, by Glenn V. Fuguitt, David L. Brown, and Calvin L. Beale. New York: Russell Sage Foundation, 1989. 512 pages. $55.00 hardback. ISBN 0-87154-272-2.

In this book, the authors examine recent demographic shifts in rural America, including population distribution and small town growth. The book also addresses numerous rural/urban differences that show up in social demographic measures, such as household growth and structure, labor force and employment, as well as income and poverty.

Although urban-rural contrasts may have been reduced over the last several decades, the two areas remain in many ways different. These differences are clarified throughout the book. With a few exceptions, though, *Rural and Small Town America*'s analyses of demographic and socioeconomic trends over time end with the 1980 Census data. Many readers may find these cutoffs frustrating, since the trends in rural areas in the 1980s were so different from those in the 1970s.

—William P. O'Hare

SPOTLIGHT

SOUTH AFRICA

Population (mid-1990 est.): 39.6 million
Land area: 471,440 sq. miles
Population density: 84 per sq. mile
Births per 1,000 pop.: 35
Deaths per 1,000 pop.: 8
Rate of natural increase: 2.7 percent
Total fertility rate: 4.5 children per woman
Infant mortality rate: 55 infant deaths per 1,000 live births
Life expectancy at birth: 63 years
GNP per capita (1988 est.): $2,290
Capital: Pretoria

by Gwenda Brophy

The Republic of South Africa is currently in the throes of historic transformations which will have very important implications for the future economy, government, and society of this racially divided country, as well as for the Southern African region and beyond.

Southern Africa originally contained some 1 million Bantu tribesmen and a minority of other tribes, when, in 1652, the Dutch founded a small colony in the region. In the 19th century British colonists began moving in. The Boer War of 1899-1902 established the country as a British colony, but with a strong Boer (Cape Dutch) influence, and an enormous, but disenfranchised nonwhite majority.

Some 68 percent of the country's 38 million population are black; 18 percent, European (mainly Afrikaner and British); 11 percent, colored (that is, government-defined as "mixed race"); and 3 percent, Asian. The Group Areas Act decrees where different racial groups may live; but in spite of that Act, in some cities de facto "gray areas" have been developing.

In absolute terms, the black majority's living standards are among the highest in Africa; substantial differentials nonetheless exist between the black and white population in terms of income, education levels and health indicators. Despite some development of economic enclaves, severe impoverishment exists in the four independent "homelands" set up for blacks—Boputhatswana, Transkei, Ciskei, and Venda—none of which is recognized as a geopolitical entity by the international community.

Although South Africa is rich in natural resources, gold, diamonds, and strategic minerals, for over half a century the country has followed a policy of import substitution in major industries. International economic sanctions, imposed because of the country's policies of apartheid, have restricted both South Africa's exports and the flow of investment from outside.

Population growth is the "greatest long-term problem South Africa faces," according to the Health and Population Development Minister, and South Africa is increasing at 2.6 percent per year. A broad-based population program was launched in 1984 "to establish an equilibrium between population size and available resources." Current fertility levels for the black population are 4.9 children per woman; for mixed races, 2.9; Asians, 2.3; and whites 1.7.

These fertility levels largely reflect differentials in contraceptive usage, which are high among the white population. In the black population, prevalence levels vary enormously, being much higher in urban than in rural areas. Regarding another influence on fertility—marriage—one in three marriages among whites now ends in divorce, according to a recent study. There has long been a pattern of union instability among the black population, while Asian marriages are apparently the most stable of all.

Legal abortion is very limited in South Africa. The Abortion Reform Action Group has been campaigning for changes in the law. A clinic in Boputhatswana, a homeland not bound by South African law, recently offered abortion services; women from cities as far away as Cape Town and Soweto came to utilize the clinic.

As South Africa enters the 1990s, it faces continued international pressure for change; internal pressure has come not least from South Africa's own business leaders, who have seen at first hand the cost of separate development in terms of work force efficiency. The country currently faces the structural problem of serious skill shortages, coexisting with high black unemployment. Massive outflows of young professionals, in the last few years mainly to the United Kingdom and Australia, have also had serious consequences.

The Bush Administration looks to South Africa as the "motor of development" in the Southern African region; events there over the next few years may well be crucial for a substantial portion of sub-Saharan Africa.

Gwenda Brophy is currently a consultant at Southern African Demographic Research, Swaziland.